MARINE REVIEW.

VOL. X. CLEVELAND, O., DECEMBER 27, 1894. No. 26.

To Manage the Whaleback Barges.

The REVIEW has learned that arrangements are being made between the Americau Steel Barge Company of New York and Pickands, Mather & Co. of Cleveland, whereby the latter firm will act as operating agents for the barge company during the season of 1895. Details have not as yet been arranged, but it is understood that all the boats of the barge company on the lakes will next season be operated through the office of the Cleveland firm. The barge company now has on the lakes a fleet of twenty-six boats, of which six are steamers. The aggregate net registered tonnage of the fleet is 25,781, and the insurance valuation $2,600,000. Another steamer now building at West Superior will be added next season. The main object of this move on the part of the barge company is, of course, to secure the advantages of the ample facilities of Pickands, Mather & Co.

Henry A. Chapin and His Iron Mine.

Henry A. Chapin of Niles, Mich., owner of the fee of the Chapin mine and whose name is most familiar among men who have acquired wealth in the Lake Superior mining region, has been in very poor health for some time past, and announcement of his death has been expected almost any time of late. About thirty-five years ago, when what is known as the Menominee range was an unbroken wilderness, Mr. Chapin offered in settlement with some of his creditors, the property that includes the Chapin mine for $250. A question of title hung over the Chapin property, and the creditors preferred money or other land. What Mr. Chapin gained, or what the creditors lost by their refusal to accept the property offered to them, may be partially estimated from the fact that he has already received over $1,500,000 in royalty, paid him by the lesses of the Chapin mine, while he or his heirs can still confidently anticipate a large annual income from the same property for years to come. From penury it has not only raised him to affluence, but made him one of the richest men in Michigan. Much of his wealth is invested in Chicago real estate.

Miscellaneous Mention.

Nothing has been heard of the lake-built steamer Keweenaw, which was caught in a big gale on the Pacific coast early in the month, and it is now quite certain that she has been lost with all hands.

S. F. Hodge & Co., of Detroit will construct engines for the wooden passenger boat to be built by E. W. Heath at Benton Harbor, Mich.. for the Arnold Transit Company. The boat will be 130 feet over all and 10 feet molded depth, and the engines will be triple expansion with cylinders 11, 18 and 29 inches by 18 inches stroke. A Scotch boiler 10 by 11 feet will furnish steam.

Engineer Nabor Solani of the Royal Italian Navy, whose knowledge of marine engineering subjects created a very favorable impression at the world's fair congress, is of the opinion that the bed plate in marine engine framing is unnecessary, and that there could be no better system than that adopted in several Italian vessels, in which the supporting columns of the cylinders and main bearing seatings are fixed directly upon the framing or box girders, which are formed mostly of plates and angle bars like those of the hull, of which they form part.

The Light-house Keeper.

A characteristic letter from Capt. John Lowe of Cleveland, has just been forwarded to Norman B. Conger of Detroit, weather bureau inspector in charge of the lake marine service. Mr. Conger has been collecting opinions from vessel owners and masters regarding the usefulness of the signal stations at Thunder Bay and Middle Islands, and the telephone lines connecting them to Alpena. Following is the reply of Capt. Lowe:

NORMAN B. CONGER, CLEVELAND, O., Dec. 26, 1894.

Inspector Weather Bureau,

Dear Sir.—Yours of the 24th inst. relating to Thunder Bay island and Middle island signal stations is at hand, and I desire to say that these stations are benefits in advance. We observe signals at Port Huron, when bound up, and often Sand Beach is obscured from view by fog, haze or smoke, our vessels, also, being off shore possibly too far. But in making good courses, either way, Thunder Bay island is sighted if the weather is not too thick. I have personally availed myself of Middle island anchorage once and taken refuge in Thunder bay twice, in weather that was really troublesome if not disastrous, having my judgment confirmed by sight of signals, and avoided much anxiety thereby. I am in the towing business and am compelled to stop often when single steamers go through, and aside from the knowledge of available harbors while passing these points, it is somewhat cheerful to note that Uncle Sam has an eye to our welfare in warning all feeble craft, at least, to look out for storms. I have seen Thunder bay and False Presquile anchorages used by numerous craft while signals were flying on the islands. Mackinaw City is the last point we see while coming down till we sight these two places. Should there be no display on Thunder Bay island, we cross the bay to the south'ard, taking it for granted that we are probably out of the way of storm. We are often days without daily papers, and the probabilities are unknown to us, so that the sight of a signal in the middle of Lake Huron is more than a novelty. The telephones there are of as much use as anywhere. Reports of a vessel ashore or a foundering craft are communicated through them to rescuers or to others interested. I shall not take you back thirty years to the white bone decades, nor surfeit you with stories of rescue since the days of values have set in, but I believe the keepers of lights and stations on these islands realize their mission of usefulness to the world at large since the day of signals with them began. Your Eagle river storm signal on Lake Superior is also a light in a dark place. The day is near when all light keepers will have telephone connection with the cities of the earth, and fish eating maniacs on those isolated sands, lonely isles, barren peaks and jagged rocks, who are rich in the air of heaven, but are too far from civilization to be rich in anything else, may hear the chimes ring on a Sabbath morning.

JOHN LOWE.

A Task Worthy of a Nation.

A late report from the trustees of the Chicago drainage canal shows the magnitude of the enterprise. It has been rightly said of this great canal that it is a task worthy of a nation. Since its inception expenditures amount to $10,193,130 and the trustees have on hand $2,466,388 each. More than 40 per cent of the material in the channel has been excavated, and there are at present actually employed on the work 6,179 men. The present estimate for the whole work is $27,000,000, and the close of 1896 is now fixed as the time of completion.

Utilizing the Power of Ocean Waves.

How to successfully utilize the power of ocean waves is a problem which has attracted attention for a great many years, and not a few of the latter-day appliances are but slightly modified imitations of what had been proposed and used generations ago. During a voyage from Stockholm to New York, more than forty years ago, a ship's master fixing a spar aloft, one end of which was ten or twelve feet above the top of the vessel's pumps, and the other projected over the stern. To each end was fixed a pulley. He then fastened a rope to the pump rods and after passing it through both pulleys along the spar, dropped it into the sea astern. To the rope he fastened a 110-gallon cask containing about sixty gallons water. This cask answered as a balance weight, and every motion of the ship from the roll of the sea made the machinery work. When the stern descended, or when a sea raised the cask, the pump rods descended, and the contrary motion of the ship raised the rods, and, with them, the water to be pumped. The arrangement, which, according to the available accounts, worked quite satisfactorily, is remarkably similar to more than one of the wave motors which have been put into service during the past half-dozen years.—From Cassier's Magazine for January.

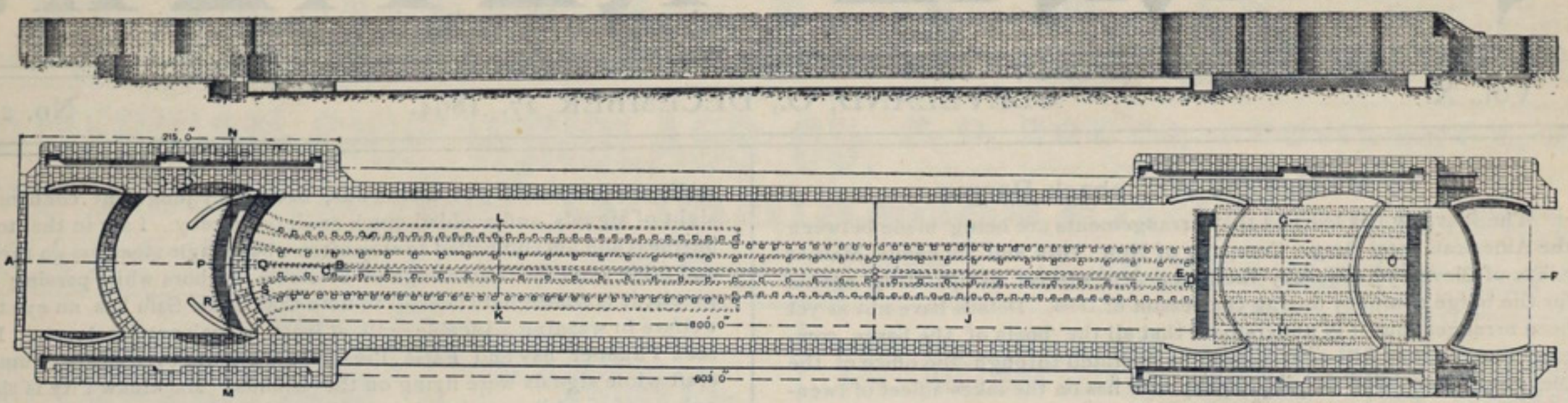
Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Dec. 15, 1894:

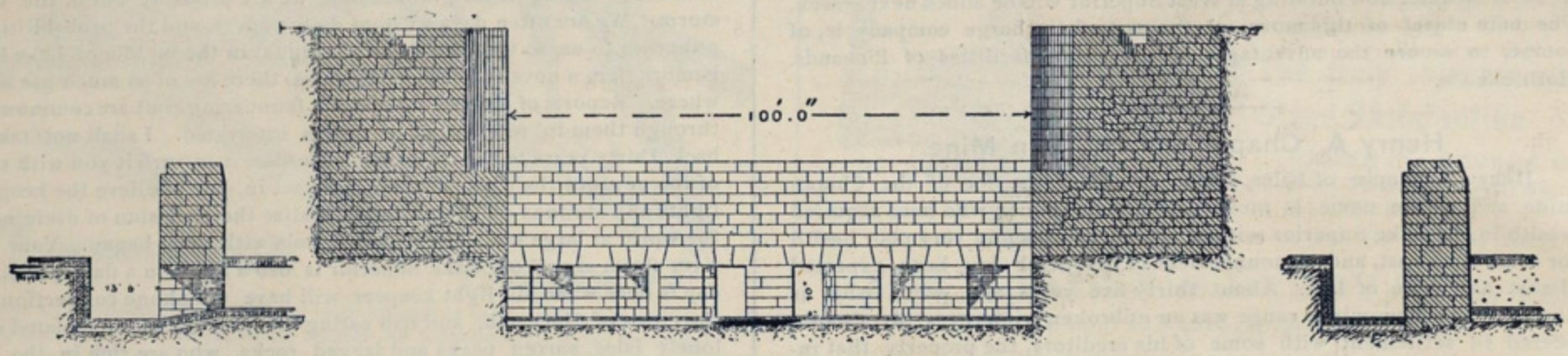
	Wheat, bu.	Corn, bu.
Chicago	26,173,000	1,716,000
Duluth	7,226,000	3,000
Milwaukee	808,000	.....
Detroit	1,315,000	27,000
Toledo	3,264,000	1,003,000
Buffalo	4,742,000	395,000
Total	43,528,000	3,144,000

At the points named there is a net increase for the week of 1,166,000 bushels of wheat and 328,000 bushels of corn.

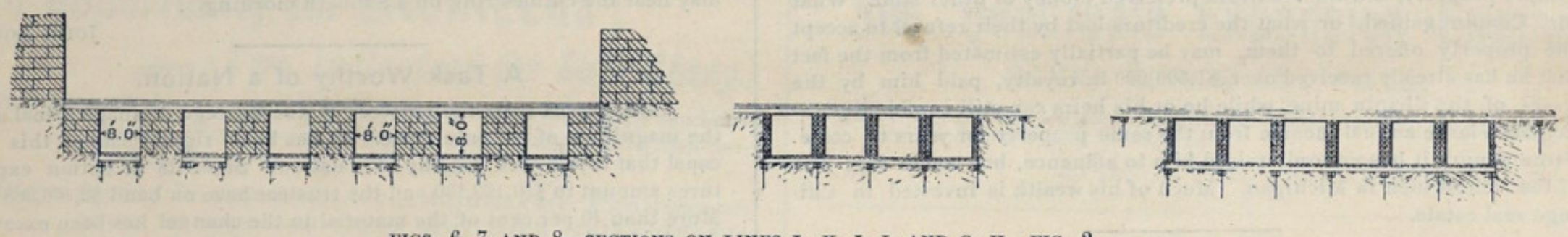
CANADIAN CANAL AT SAULT STE. MARIE.



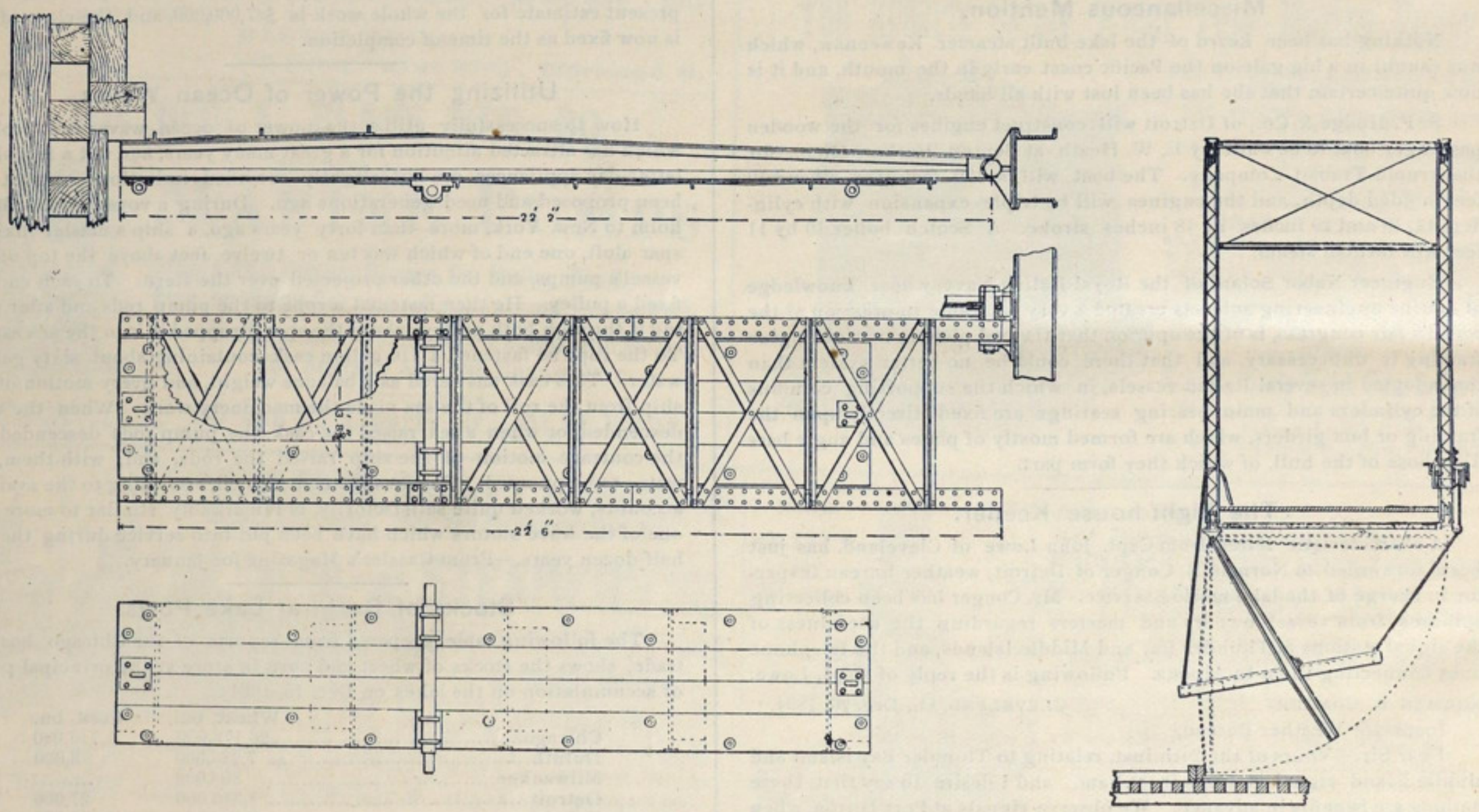
FIGS. 1 AND 2—LOCK IN SECTION AND PLAN OF LOCK.



FIGS. 3, 4 AND 5—DETAILS AND SECTION ON LINE N. M., FIG. 2.



FIGS. 6, 7 AND 8—SECTIONS ON LINES L. K. I. J. AND G. H., FIG. 2.



FIGS. 9, 10, 11, 12 AND 13—VARIOUS DETAILS OF THE LOCK.

Canadian Canal at Sault Ste. Marie, Ont.

Engravings on the opposite page give details of the new Canadian canal and lock at Sault Ste. Marie, Ont., which it is expected will be open for the passage of vessels to and from Lake Superior at the opening of navigation next season, or at least some time in advance of the opening of the new American lock at the Sault. This canal has been described on several occasions in the REVIEW, and from an engineering standpoint the details of construction are sufficiently clear in the engravings to make it unnecessary to go further into a description of them.

The canal, which has cost the dominion government nearly $5,000,000, is the last link in a chain of waterways connecting the head of Lake Superior with the Atlantic. It is to be finished, however, considerably in advance of the other important Canadian canals along the St. Lawrence, which are being constructed on a scheme of only 14 feet depth. The main dimensions of this waterway, which will be known as the Canadian Sault canal, are 3,500 feet long, with a mean width of 152 feet, which is capable of carrying vessels drawing 20 feet of water. The lock is 900 feet in length by 60 feet wide, with a little over 20 feet of water on the sills. This lock is 100 feet longer and of practically the same depth as the new lock on the American side, but in width it will not admit of two of the largest lake vessels being docked abreast of each other as will the new American lock. Since the first contract was given out six years ago, the designs have been changed three times, the plans being enlarged to suit changes in dimensions of lake vessels. The first contract was for a lock 600 feet long by 85 feet wide, narrowing to 60 feet at the entrance, and 16 feet deep. Changes equally great have also been made in plans for the lock on the United States side since it was first designed.

The engravings published herewith are from plans furnished to a London journal, Industries and Iron, by the Dominion government.

Detroit River Traffic—From a Government Report.

Army engineers in charge of river and harbor improvements in all parts of the United States are required by law to report each year upon the commerce of ports or districts in which such improvements are being made. It is quite generally understood that on account of the absence of customs regulations by means of which the commerce passing through the Detroit river might be fully ascertained, there are no statistics that are entirely reliable regarding the tonnage of that great waterway. But of late years Assistant Engineer H. Kahlman, of Detroit, who has had local charge of Detroit river improvements under the direction of Gen. O. M. Poe, corps of engineers U. S. A., has prepared from reports furnished by collectors of customs a summary of Detroit river traffic, which is probably the most reliable collection of data of this kind that is available. Gen. Poe includes this summary in his annual report for the year ending June 30, 1894, which has just been given out by the war department. The report gives the number of vessels passing Detroit in 1893 as 33,165, of 23,091,889 registered tons. According to this same report, the number of vessels cleared from all collection districts on the chain of lakes in 1893 was 51,649, of 34,571,208 registered tons. These statistics do not include Canadian vessels. Following is the report in full:

COMMERCE OF DETROIT RIVER DURING THE SEASON OF 1893, COMPRISING STAPLES ONLY, AND ONLY SUCH STAPLES AS CLEARED FROM UNITED STATES PORTS.

Commodities.		Amounts.	Tons.
Iron ore and finished iron			6,800,521
Coal			6,921,303
Wheat	bushels	70,516,116	2,137,155
Flour	barrels	9,528,794	952,879
Corn	bushels	4,624,154	140,125
Flax seed	bushels	57,600,309	1,612,808
Malt, barley, and oats	do	28,153,832	633,961
Copper ore			87,993
Stone			219,695
Salt	barrels	443,786	68,290
Provisions			325,500
Lumber	feet B. M.	929,081,000	1,393,621
Shingles	pieces	28,033,000	4,680
Laths	do	16,310,000	3,200
Cement	barrels	740,506	105,786
Unclassified freight			1,640,682
Telegraph poles	pieces	171,480	21,200
Cedar posts	do	3,401,680	22,500

Number of vessels, 33,165; registered tonnage, 23,091,889 (exclusive of Canadian vessels).

TOTAL NUMBER OF VESSELS AND TONNAGE CLEARED FROM ALL THE COLLECTION DISTRICTS ON THE CHAIN OF LAKES, SEASON OF 1893.

Vessels	51,649
Registered tonnage	34,571,208

NUMBER OF RAILWAY CARS LOADED THAT CROSSED DETROIT RIVER DURING 1893.

East bound	183,618
West bound	121,323
Total	304,941
Tonnage at an average of 15 tons per car	4,574,115

Massive Masonry.

With a great stone power house and office building, and long canal approaches of similar construction, the new United States canal lock at Sault Ste. Marie, Mich., will appear to the casual observer simply as a magnificent work of masonry. It is interesting, therefore, to note the amounts of stone, concrete, etc., involved in this masonry. On June 30, last, the date of Gen. Poe's latest annual report, which has just been printed, the masonry work on the lock proper was practically completed, and a glance over the report on this feature of the work shows that the lock contains 10,522 cubic yards of concrete, 18,615.02 cubic feet of cut stone and 48,267.04 cubic feet of backing stone, or a total of 80,876.61 cubic feet of masonry, of which 13,985.55 cubic feet is mortar and spawls. In percentages the proportions are 59.7 backing, 23.1 cut stone and 17.2 mortar and spawls. The total number of pieces of cut stone in the lock is 14,150, and this will be increased by 100 or more in work yet to be completed. The largest size of cut stone used contained when cut 105.25 cubic feet, weighing 16,543 pounds. The smallest contained 5.88 cubic feet, weighing 924 pounds. The mean volume of the total number of pieces used was 35.44 cubic feet. In this construction 79,957 barrels of cement was used, and the earth filling behind the lock walls amounted to 55,748 cubic yards.

The estimated cost of the new lock is $4,738,865, of which $3,980,000 has been appropriated. The present congress will very probably appropriate $500,000 more, or enough to insure the opening of the new lock after another season has passed with the present facilities.

Official Notice of Lake Carriers' Meeting.

LAKE CARRIERS' ASSOCIATION, Office of the Secaetary.
BUFFALO, N. Y., Dec. 22, 1894.

The annual meeting of the Lake Carriers' Association will be held at the Cadcllac hotel, Detroit, Mich., on Tuesday, Jan. 8, 1895, at 10 o'clock a. m. The meeting will probably remain in session for at least two days. The annual reports of the treasurer and board of managers will be presented. A new board of managers and officers for the ensuing year will be elected, and many important questions, affecting the welfare of lake carriers, will come up for discussion and action. The meeting not only affords an opportunity to transact the important business of the association, but gives vessel owners the one chance of the year for a general exchange of views on matters connected with lake navigation. The secretary is already assured of a large attendance, and you are earnestly requested to make every effort to be present.

By Order of the Board of Managers.
JAMES CORRIGAN, President,
CHARLES H. KEEP, Secretary.

Car Ferry Engines.

Contracts for machinery for the two car ferries to be built by the Craig Ship Building Company of Toledo for the United States and Ontario Steam Navigation Company (Conneaut-Port Dover line,) have been placed with the Frontier Iron Works and S. F. Hodge & Co., both of Detroit. Each of the Detroit firms will engine one of the boats. Engines will be the same as those in the Ann Arbor ferries, now on Lake Michigan. In these boats the after engines, two sets, are 23 and 46 by 36 inches and the forward engine 20 and 40 by 36 inches.

Chicago Drainage Canal Question.

Editor MARINE REVIEW:—I notice that the Buffalo Enquirer of Dec. 18 has an article somewhat in answer to a communication in the MARINE REVIEW of the 13th, which referred to an article of mine in your issue of Oct. 11. I am very sorry that communications of this kind can not be answered over the signature of the party writing, as he (the writer of the 13th) is answering an article over my own signature. I am interested in navigation to the gulf from the great lakes through the Illinois river valley—a waterway that is within the bounds of reason. Sewage must be kept out of navigable waterways, be they natural or artificial. The general government will never be a partner with city or district for sewage disposal. Surround it by law as much as congress will, a precedent will be established, and every city, town district or whatever it may be called will say: "You helped Chicago, now help us to dispose of our sewage."

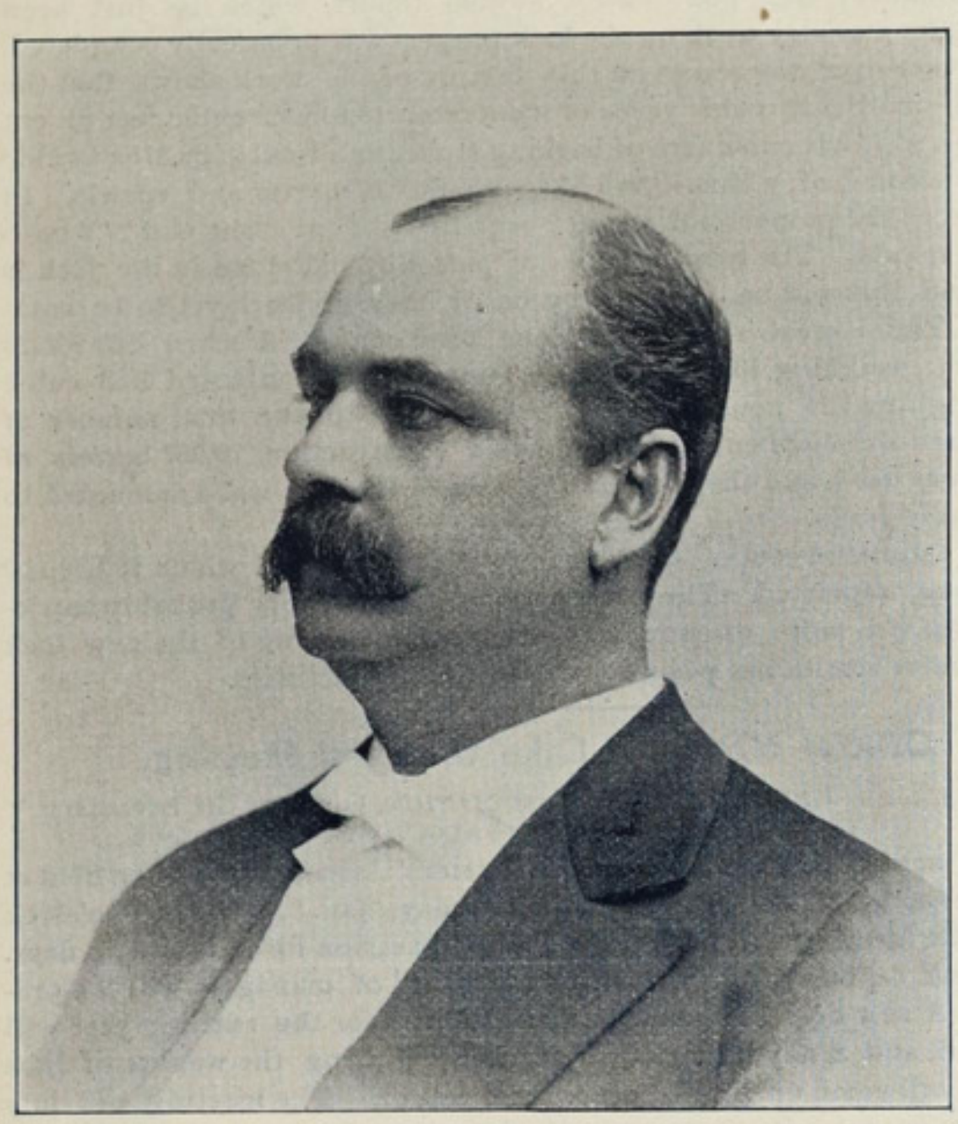
Chicago, Ill., Dec. 25, 1894. Gordon H. Nott.

An English exchange contrasts the cost of a steamer of 3,500 tons capacity built on the Clyde in December, 1889, with the cost at which such a boat may be purchased from the same builders at the present time. The former price was £31,500 against £21,500 at present. Machinery is the same in both cases—triple expansion, 22,35 and 59 inches by 39 inches stroke.

"ROPER'S LAND AND MARINE ENGINES," BOUND IN MOROCCO WITH FLAP AND POCKET, WILL BE MAILED TO ANY ADDRESS FOR $3.50 SENT TO THE MARINE REVIEW, CLEVELAND, O.

A Prominent Marine Engineer.

The portrait presented herewith will be recognized by marine engineers generally as that of George P. Wilson, past national president of the Marine Engineers' Beneficial Association. He was at one time in the Morgan line of steamers, running between New York and New Orleans, but for several years he has been engaged as sales agent for a well known



GEORGE P. WILSON, PAST-PRESIDENT M. E. B. A.

metallic packing. He is highly regarded among the engineers, and his acquaintance among purchasing agents of ship building concerns and steamer lines is usually the means of his trips being profitable and his order trade permanent. If any engineer is in doubt as to which is the best packing, he can find out by addressing the original of the above in care of the Columbian Metallic Packing Company, Philadelphia, Pa.

A Letter from Rumsey.

Shipping master Rumsey of the Lake Carriers' Association, who left Cleveland a few weeks ago on a trip around the world, has been writing to a few friends in Cleveland, and among the letters is one to the REVIEW. He writes as follows from the Great Southern Hotel, Lakes of Killarney, under date of Dec. 10:

"Since my arrival on this side I have been nowhere except in Ireland. The country is the grandest anyone ever saw; the grass is green and the cattle, fine fat cows and sheep, such as were never seen in America. But the great majority of the people, poor souls, in the poorer districts, are not in happy circumstances. I took a car from Cork and was driven twenty-five miles into the country. I thought my heart would break before I got back. To see the people, wives and children in houses of clay and cobble stones, with only the bare ground for a floor, and husbands working on farms for a shilling a day; old women and little children barefooted, with nothing but potatoes and flour for food and not too much of either. I had but the driver to pay and my arrangements with him were for sixteen shillings, but on my return I found that the trip had cost me $12, although I gave no one more than a shilling. I cried half the way back to Cork. You may think it was on account of the money, but not so. I will explain it to you when I get back.

"I was at Father Matthew's grave and at Blarney Castle and kissed the stone. I had one of the men use a hammer on it, too, and I will bring you home a piece if I ever get back. To-day I shook the hand of Kate Kearney at the lakes of Killarney and took a sip of her mountain dew—a small sip. I toiled along the rugged pathway of Dunloe and called at Muskroy's Abbey, where rests the ashes of the McCarthys, O'Donovans and O'Sullivans. When I return do not let me forget to tell you of the lake in which St. Patrick drowned the last serpent, and many other interesting places in this interesting country. To-morrow I leave for Dublin, and thence to Belfast, Londonderry, Glasgow, Edinburgh, Carlisle, Manchester, Liverpool, Birmingham with side trip to Stratford, London, Paris, Marseilles, Algiers, Monte Carlo, Nice, Genoa, Milan, Venice, Florence, Rome, Naples, Brindisi, Alexandria, Cairo, Port Said, Jaffa, Jerusalem, Colombo, Melbourne, Sidney, Auckland, San Francisco and Cleveland."

Big Increase in Portage Lake Canal Business.

War department records of the commerce of the Portage lake ship canals for the past season show an increase of 32 per cent. over 1893 in the freight tonnage of the canals. The movement of freight of all kinds through the canals in 1894 amounted to 754,973 tons against 532,628 tons in 1893. Since these canals were purchased by the government and improvements made in them, the commerce has been steadily increasing, and the excess of freight tonnage this year over 1893 is proportionately greater than any increase reported from other parts of the lakes. The canals extend across the Keweenaw peninsula, Lake Superior, tapping the extensive copper and lumber regions in that portion of Michigan, and the increased tonnage is, of course, largely in coal, copper and lumber. The canal traffic in these commodities for the past two years was as follows: Coal, 1894, 332,862 net tons, against 254,705 tons in 1893; copper, 1894, 72,389 tons, against 64,412 tons in 1893; lumber, 1894, 84,848,000 feet, against 42,863,000 feet in 1893. A full statement of the commerce of the canals for the two years follows:

COMPARATIVE STATEMENT OF COMMERCE THROUGH PORTAGE LAKE SHIP CANALS, MICHIGAN, SEASONS OF 1893 AND 1894.

Items.	Design't'n	Seasons.		Increase.	Decrease.
		1893.	1894.		
Vessels	Number	14081	1724	316	.....
Tonnage Registered	Net tons	669510	860618	191108	.....
Coal	" "	254705	332862	78157	.....
Flour	Barrels	215548	651396	435848	.....
Grain	Bushels	38264	10900	.....	27364
Manufactured Iron	Net tons	8946	7179	.....	1767
Salt	Barrels	23985	29398	5413	.....
Limestone	Net tons	9356	12365	3009	.....
Copper	" "	64412	72389	7977	.....
Building Stone	" "	1180	1096	.....	84
Iron ore	" "	400	2301	1901	.....
Pig Iron	" "	3189	752	.....	2437
Lumber	M. feet b. m.	42863	84848	41985	.....
Miscellaneous	Net tons	88172	104294	21122	.....
Total cargo.	" "	532628	754973	222345	.....
Passengers	Number	27084	32636	5552	.....

Some of the largest vessels now on the lakes use the canals but they are, of course, limited in the amount of cargo carried. In 1894 the four largest steamers using the canals were the Globe of 2.996 registered tons, North Star of 1,885 tons, German of 1,875 tons and Gladstone of 1,812 tons, while in 1893 the four largest were the Avon of 1,539 tons, J. H. Wade of 1,502 tons, Portage of 1,451 tons and Montana of 1,383 tons.

Publications.

The third and concluding paper on the life of "John Ericsson, the Engineer," by Col. William C. Church, is given in Cassier's Magazine for January. Special attention is devoted in this last paper to the famous Monitor, and several illustrations are given representing fac-similes of Ericsson's original pencil drawings of the vessel.

Capt. J. W. Shackford of New York, who represented the United States as a marine expert in the International Marine Conference, has recently contributed to New York papers a defence of the system of fog signals formulated by the conference, and which are to be adopted, with other rules to prevent collisions at sea, by leading maritime nations in March next. A leading article from him on the subject was published in the New York Herald of the 12th inst. The fog signals have been the subject of a great deal of unfavorable criticism from ship owners throughout Great Britain, but it is not probable that the British board of trade will depart in any way from the agreement to adopt the new rules.

This being purely a matter of national business competition, our lawmakers at Washington should see to it that no merchant shipping act of parliament places the British ship owner in such a favorable position but that a merchant shipping act of congress will do a little better for the American shipowner, even if it does cost a little to do so. Public moneys thus spent would be but a small commission on the trade thus secured for the country.—Geo. W. Dickie, Union Iron Works, San Francisco.

Nautical.—"And so you had a narrow escape coming over from London?" "I had, indeed; the coal ran out, and the captain had to split up the ship's log to keep the fires going."

"SAILING DIRECTIONS FOR LAKE SUPERIOR, ST. MARY'S RIVER AND STRAITS OF MACKINAC" IS A PUBLICATION JUST ISSUED BY THE UNITED STATES HYDROGRAPHIC OFFICE. IT IS FAR IN ADVANCE OF PUBLICATIONS OF THE COAST PILOT KIND. PRICE $1. ADDRESS MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O. WE HAVE NO HESITANCY IN RECOMMENDING THIS BOOK.

Present Status of the Nicaragua Canal Question.

Readers of the REVIEW who have given about as much attention as the average citizen of this country to the Nicaragua canal question, which is again prominent among congressional matters, but who have not the time to wade through columns of telegrams from Washington on the subject, may be interested in a short statement of the position now taken by the promoters of this big scheme. Heretofore the canal companies have professed confidence in carrying out their plans with private capital, but in the present congress they appear as applicants for the guarantee of their bonds with the admission that the project can not be undertaken without government aid. The bill which is now being pushed with some vigor provides for a guarantee of $70,000,000 of the canal company's bonds, an amount which is said to be sufficient to cover cost of construction. Even were it admitted that the amount named is sufficient to construct the canal, which is of course one of the most important features of the whole question as far as the government is concerned, the chances of this bill passing at the present short session, and with the finances of the government not in the best of shape, are not encouraging. But since discussion of the measure was begun, a strong feature of opposition, and one that seems quite certain to result in defeat of the bill, has been brought out. It is argued that on account of doubt as to whether the $70,000,000 proposed would be sufficient to cover the cost of construction, the whole plan should be subjected to more severe scrutiny than it has hitherto received. The bill now before congress provides for an examination, but objection to it is based on the fact that it is proposed to carry the guarantee with the examination. Under the terms of the measure the the president is directed to appoint a competent commission of engineers, who shall make an examination and report upon the practicability of the canal and its cost. If their report is favorable the guarantee features of the bill are to be carried out, and it is this coupling of the work of the commission with the $70,000,000 guarantee that is pronounced unfair to the government. A separate enactment constituting such a commission might have met with success, but this is not what the canal people are after.

Science in Launching Ships.

One of the most interesting papers read at the second annual meeting of the Society of Naval Architects and Marine Engineers in New York, last month, was prepared with a view to encouraging the collection of information regarding launches under different conditions, all having a bearing on the resistances of ships after launching and the power required to stop them after leaving the ways. Short reference to the paper, which was prepared by Naval Constructor William J. Baxter, was made in a a report of the meeting contained in the REVIEW of Nov. 15-22, but the most interesting feature of it was a description of an apparatus for automatically registering velocities, which was improvised and used at the Norfolk navy yard during the launches of the twin screw cruiser Raleigh and battleship Texas. In describing the apparatus, Mr. Baxter says:

"If one end of a long length of wire which is wound on a drum be wound once around a freely revolving wheel and then attached to a ship or other moving object, the wheel will be rotated. Knowing the number of revolutions occuring during a known time of this pulley, whose circumference is known, the exact distance the ship travels during this time can be accurately determined if the line be kept continually taut between the pulley and ship; also, if each revolution of the pulley be accurately timed, the exact position of the vessel at each instant will be known, and, knowing this, the velocity, acceleration, and coefficient of friction can be determined. The apparatus used to accomplish this was as follows:

"On a heavy piece of timber two rigid bearings were securely fastened; one carried a pulley ordinarily used for wire rope transmission, which had been accurately balanced and turned; the other bearing carried a strong balanced wooden drum on which was coiled a steel piano wire, No. 16, 1,000 feet long. On one side of this drum was a groove over which passes a manilla rope which acted as a friction brake, being weighted by a keg containing water. The wire being wound once around the drum, the brake was adjusted so that there was no perceptible sag in the wire, and as an additional precaution a water tank was arranged to gradually fill the keg, thus increasing the tension of the wire, and ensuring that it was continually taut from start to finish. The revolutions were timed by the Weaver electric speed register. This ingenious instrument was designed to carry into effect Engineer-in-Chief Melville's method of making speed trials by registering the number of revolutions of the screw shafts. It is a chronograph fitted with five pens electrically controlled, having a piano action. When the corresponding circuit is completed, a pen makes a dash on a paper tape which is moved by a clock train with extreme uniformity. The central or time pen is connected with a chronometer and marks each second. The revolution pen on each side marks each revolution of the port and starboard shafts, while the outer or range pens mark simultaneously the instants of beginning and ending the measured mile run, permitting a datum line to be drawn across the tape from which are measured the fractional parts of time and revolution.

"The register was adapted to the present experiment by fitting a make-circuit attachment to the axle of the wire rope pulley, and connecting it to a revolution pen. The range pen was connected to a portable button in the hands of an observer, while the time pen was connected to a break-circuit chronometer and relay. The register and two sets of drums and pulleys were placed underneath the launching platform at the bow. When the men began sawing off the sole piece, the observer signalled to an assistant, who threw on the circuit and started the register; the time pen began marking at once, as the ship moved, the revolution pens began marking, all three acting automatically until the finish. The observer, with the range pens, noted the time of starting, letting go the anchor, pivoting, stoppers breaking, and hawsers tautened, etc. With the Raleigh, one wire was made fast to cradle and the other to the ship, the intention being, if possible, to determine whether there was any difference in their motion, but, through the overzeal of workmen, the wire attached to the ship was severed before the ship came to rest. Fortunately, however, the cradle only partially left the ship as the anchor was let fall into it, and after a slight retardation the cradle again took up the motion of the ship. With the Texas, both lines were attached to the ship as a measure of special precaution. One snapped after the ship had travelled a short distance, but the other registered continually until the ship stopped. Mr. Baxter presented with his paper several engravings of curves showing the exact distances traveled by the ships during certain periods of time and their position at each instant, together with the velocity, acceleration and coefficient of friction. As showing the extent to which the collection of data was carried out by the experiments, the following summary from the papers is reproduced:

	Raleigh.	Texas.
Date of launch	Mch. 31, '92.	June 28, '92.
Temperature of air, degrees Fahrenheit	50	86
Length of load water line	300′–0″	301–4
Depth from keel to upper deck at side	33–7	39–9
Breadth	42–0	64–1
Length of ground ways (total)	336–6	381–9
Length of ground ways beyond sea wall	57–6	94–0
Length of sliding ways	205–3	215–0
Width of sliding ways (actual)	1–3	2–6
Width of sliding ways (effective)	1–1	2–2
Area of sliding ways (effective) square feet	447.7	932.7
Spread of ground ways, center to center, forward	13–5	12–10½
Spread of ground ways, center to center, aft	13–11	13–0
Inclination of keel blocks per foot	0–⅝	0–$\frac{12.7}{16}$
Inclination of ground ways per foot	0–¾	0–$\frac{12.7}{16}$
Inclination of ground ways per foot, transversely	0–½	0–½
Camber of ground ways in total length	0–4	0–6
Depth of water on end of ways	8–2	12–8
Distance from stern post to water level	0–7½	0–10
Launching weight of hull and fittings, tons	1,157.4	2,198.7
Launching weight, miscellaneous	24.5	52.5
Launching weight of machinery	46.4	70.3
Launching weight of cradle	93.5	127.5
Total launching weight	1,321.8	2,449.0
Pressure on sliding ways, tons per square foot	2.97	2.62
Center of gravity of hull abaft midship section	5.07	3.15
Center of gravity of hull below L. W. L	2.09	
Center of gravity of hull above L. W. L		0.9
Metacentric height	3.75	10.04
Draft of water after launch, forward	6–1	9–0⅝
Draft of water after launch, aft	12–3⅞	12–0⅞
Time from starting to stopping, seconds	58	49
Time from starting to maximum velocity, seconds	23	16
Time from starting to pivoting	23.7	23.2
Velocity at flotation, feet per second	18.1	15.1
Maximum velocity, feet per second	18.8	18.6
Maximum velocity, knots per hour	10.77	10.66
Distance travelled before entering water, feet	10–0	12–6
Distance travelled to maximum velocity	182	154
Distance travelled to beginning of pivoting	253	300
Distance travelled to finish	519	551
Coefficient of friction, initial	0.051	0.026
Coefficient of friction, mean, to time of entering water	0.048	0.020

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The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1893.	1892.	1891.	1893.	1892.	1891.
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of Navigation	219	223	225	365	365	365

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MR. EDWARD P. NORTH, who is a prominent member of the American Society of Civil Engineers, and who is recognized as a leading authority on the subject of commercial waterways in this country, is quoted as saying that in ten years from now the tonnage passing the city of Detroit, with the three locks at the Sault and 20 feet of water in lake channels, will very probably be no less than 50,000,000 tons. This estimate is based on the fact that in ten years ending with 1893 the freight tonnage passing through the St. Mary's Falls canal increased from 2,267,105 to 13,195,860 net tons. This increase in the business of Lake Superior alone certainly seems large enough to bear Mr. North out in his estimate of the commerce passing, which is practically the through commerce of the entire chain of lakes. Mr. North is a graduate of Union College, Schenectady, N. Y., and this matter was brought out in a lecture which he delivered at the college recently on the "Relation Between Cheap Transportation and National Prosperity." It was the first of a series of lectures on the larger problems and economic results of engineering, to be delivered by prominent engineers before the students at Schenectady. In all parts of New York state interest in the relations of the Erie canal to lake commerce seems to be increasing. Mr. North said that the proposition to increase the Erie canal by two feet in depth might bring tonnage back for a few years to the figures of 1800, but it could never encourage production by making radical reductions in the cost of freightage. He proposed in modification of Ex-State Engineer Sweet's plan, a full sized canal to Cayuga and Seneca lakes and also a branch to Lake Ontario at Oswego. These two short canals would make upper Canada tributary to New York and would establish large shipping and receiving ports at Watkins and Ithaca. By this plan some 63 miles of canal would add 140 miles to the navigable channels in New York state.

IT IS PROPOSED to establish branch hydrographic offices at Sault Ste. Marie and Duluth and to provide vessels on the lakes for use in the hydrographic service. The REVIEW has kept a close account of all that has been done by army and navy officers on the lakes during the past several years, and without prejudice towards any of the several branches of these departments, we suggest that the vessel owners at their coming annual meeting refrain from committing themselves to propositions for a further increase in the number of government officers. By this we mean such officers as are proposed for scientific and experimental work, and not the army and navy officers who are engaged regularly on river and harbor improvements and in the light house service. The hydrographic office has been engaged in a practical and beneficial work in getting out books of sailing directions for the lakes, but aside from this its efforts have not been of the kind to demand immediate attention from the vessel interests when appropriations are needed for more urgent purposes, and when all money coming out of the public treasury is charged up by congressional committees to the district in which it is used.

THE REVIEW ventured the statement a week ago that, notwithstanding the ruling of the steamboat inspection survice against the use of passing signals unless vessels are actually in sight of each other, full 90 per cent of vessel masters engaged in lake commerce have, during the past season, been blowing passing signals in fog, smoke and all kinds of weather. It would seem now that instead of 90 per cent. of the captains continuing the old custom, all of them have been doing so. At a full meeting of the Cleveland lodge, Shipmasters' Association, held a few days ago, the question was brought up, and not a man could be found who was following the new interpretation of the rules.

FOR some reason the Cramps have so far refused to give out any authentic information regarding the quadruple expansion engines of the new American Line steamers St. Louis and St. Paul. A request for simply the sizes of cylinders has been refused. Harland & Wolf, the great Belfast builders, are said to maintain, even to this day, a similar position regarding engines of the Majestic and Teutonic. It is said in Philadelphia, however, that the builders of the new American Line boats will give out full information regarding their machinery a little later on, and it is to be hoped that they will do so in accordance with the liberal spirit in this regard that has characterized the ship building in this country.

IN GIVING to the Bethlehem Iron Company of South Bethlehem, Pa., a contract for the armor for two new battle ships, Russia has declared in a most positive way her belief that ships protected by American armor are better armored than those of any other nation. Shipping interests all over the country have reason to rejoice with the officers of the Bethlehem company in having secured this contract. The contract involving about $1,000,000, calls for more than 12,000 tons, and means a full year's work in the armor department. It was secured over fourteen competitors, including Krupp. The work will be begun as soon as details are received from St. Petersburg.

FOR the first time in its history, the Lake Carriers' Association will begin a new year on Jan. 8 without debt of any kind. Tonnage dues paid in during the past year has been just sufficient to meet the requirements of the year and pay off indebtedness carried over from 1893. This is one of the best indications of a continuance of the work of the work of the organization along the lines on which it has prospered during the past two years.

The Atlantic Roller.

A writer of paragraphs on ship building in Fairplay, the ship owners' journal of London, delights in ridiculing the ideas of extremists among naval architects. This is what he says of the type of steamer which M. Bazin, a French engineer, proposes to operate by means of rollers, instead of the screw:

"At last we are about to have a change from the humdrum style of naval architecture which has prevailed since Noah was a boy. Monsieur Bazin, who some little time ago startled the nautical world by his scheme for rolling over the Atlantic at 32 knots an hour has at length completed the plans, and has resolved to build at St. Denis a steamer 131 feet by 39 feet with three wheels aside, and which will roll along at about 30 knots knots an hour. This vessel is intended for Channel service between Dieppe and Newhaven, but will roll as far as the Thames, in order that all the professors and naval architects may see what Monsieur Bazin can produce. Of course this is but a modest attempt, and is only a preliminary to the great 'roller' which will sooner or later (probably later) be launched upon the great Atlantic with its eight rollers to do the passage in exactly 100 hours. This craft will have an enormous platform about 30 feet above the sea, on which will be planted houses of every possible style of architecture. There will also be churches of every denomination, Empires, Alhambras, Winter Gardens, etc., in fact, everything likely to suit the public, and the mariner's lay will be the refrain of the old song 'As we go rolling along.' We have been very hard up for an idea for a long time now. We have even looked upon the naval architect as a being who had lost all his originality, and who was being rapidly shunted by the engineers and the tubular boiler; but once more he is afforded an opportunity of putting in practice something new, and we may expect at the spring meeting of the institute of naval architects to have all kinds of schemes sprung upon us. Happy naval architects to have a fresh idea to start the new year with.

Around the Lakes.

The new steel side-wheel steamer Arrow, being built at the Wyandotte yard of the Detroit Dry Dock Company for Wehrle of Sandusky, is about ready for launching.

One hundred and three boats, having an aggregate capacity of about 175,000 net tons, are wintering in Cleveland. The number of boats is less than a year ago but the capacity is greater.

Jan. 10 is the date now fixed for launching the North Land, second of the Northern Steamship Company's big twin-screw passenger ships, at the yard of the Globe Iron Works Company, Cleveland.

Another of the Canadian passenger lines, the North Shore Navigation Company, will build a wooden passenger steamer. The boat is to be 140 feet keel, 24 feet beam and 8 feet 6 inches depth of hold, and will be built by Capt John Simpson of Owen Sound, Ont.

Lodge No. 6 Shipmasters' Association, of Milwaukee, has elected the following officers: President, Capt. Charles M. Davis; first vice president, Capt. John Wright; second vice president, Capt. James Bruce; treasurer, Capt. Fred. C. Starke; secretary, Capt. John McSweeny; trustee for three years, Capt. Henry Leisk.

Capt. Orris Irons, a well known Lake Michigan navigator, died at Pentwater, Mich., aged sixty-four years. He commanded a vessel when only eighteen years of age. His father, Capt. E. Irons, commanded a vessel in the upper lake trade nearly seventy years ago. He is still living and a resident of Pentwater.

A revenue cutter that has seen several years of service on the lakes, the Commodore Perry, will soon be protecting seals in the Behring sea. The Perry was some time ago ordered from Erie to New York, where she received extensive alterations and repairs. She left New York, a few days ago, for San Francisco.

Masters of boats trading to Lake Superior complain that during the past season they were unable to hear the fog whistle at Whitefish point when at ordinary distance from it. It is thought that boiler at the station, which is known to be an old one, is too small to supply steam required for a whistle suitable to this important point.

Capt. Geo. P. McKay of Cleveland has received from Mr. W. R. Hallam of Duluth a rare relic of early navigation on Lake Superior. It is a cane made from a piece of planking taken from the wreck of the schooner Algonquin, a few timbers of which still remain sunk in the harbor of Old Superior. The Algonquin was owned by Capt. McKay's father, and was among the first vessels on Lake Superior.

A contract has been let to Butler & Ryan of St. Paul for extensive improvements to be made this winter in the Wisconsin Central Railway Company's docks at Ashland, and it is, of course, expected that the Chicago & North Western company will immediately follow with necessary alterations in its docks. The enlargement of lake vessels has made these improvements absolutely necessary in the docks at Ashland, as there was a great advantage in the time and cost of loading at other ore shipping ports.

In accordance with the order of the association of underwriters publishing the Inland Lloyd's Register, Capt. Daniel McLeod, chief inspector, spent all of last week in Chicago inspecting boats which are expected to load grain soon. He furnished all of the general agencies with daily reports covering vessels inspected. The object of work of this kind thus early in the winter was to overcome, if possible, the danger of vessels loading grain for winter storage without making necessary repairs. Capt. McLeod says he will begin the general work of inspecting vessels much earlier than usual this year. He may, within a week or two, start two or three men to work on Lake Michigan.

Trade Notes.

W. C. White of Montreal is building a steel hull for the Ottawa River Navigation Company.

W. J. McKinnie & Co. of Cleveland, who operated the Valley railway dock up to a short time ago, have two McMyler revolving hoists which they offer for sale.

The firms of Shoenberger, Spear & Co. and Shoenberger & Co. of Pittsburg, well known in the iron trade, have been consolidated and incorporated under the name of the Shoenberger Steel Company.

There is nothing small about the Joseph Dixon Crucible Company of Jersey City, N. J. An assortment of lead pencils received from them as a Christmas remembrance will keep them in mind until another Christmas comes around.

Although taking a lease of the ship yard of the Samuel L. Moore & Sons Company at Elizabethport, N. J., Mr. Louis Nixon does not give up his connection with the Cramps. The intention is to make a specialty of torpedo boats, yachts and other similar craft at Elizabethport.

Officers of the American Line (transatlantic) are said to have been so well pleased with the work of the Newport News Ship Building and Dry Dock Company in docking and overhauling the New York, a year ago, that both the Paris and New York will be docked for general repairs in the southern yard this winter.

Double geared bar capstans and double geared crank capstans manufactured by the American Ship Windlass Company of Providence, R. I, are now made in nine sizes. This firm has established a trade all over the world in these capstans, owing to special facilities for building them and superiority of design and material. A special department is devoted to the manufacture of capstans of different sizes and kinds. These works are now acknowledged to be the headquarters of the world for hand capstans.

J. T. Skerrett of No. 3940 Spruce street, Philadelphia, is preparing to introduce on the lakes a method of calking vessels known as the "Brooks improved method." The system is patented, and circulars pertaining to it contain endorsements from the navy board of bureau chiefs, from Louis Nixon, superintending constructor at Cramps and from the International Navigation Company owning the American Line steamers St. Louis and St. Paul. Through the planking having, according to this method, chamfered and grooved edges, it is impossible to drive the packing below a bulb formed in the center of spaces between the planks. Thus it is claimed that the method prevents calking from working through decks or outside planking, stiffens decks and prevents buckling of planking and only first calking is necessary, this being done when the planking is put on. In iron or steel vessels having decks calked by this method the material is prevented, it is claimed, from working through and wedging between the deck planking and the plating.

In General.

Admiral Meade's North Atlantic Squadron, which is expected to sail for the West Indies early in January, will comprise the flagship New York, the Columbia and possibly the Minneapolis, the Atlanta, Cincinnati, Raleigh, Montgomery and Vesuvius.

Engineers will find in the annual report of Gen. O. M. Poe for the year ending June 30, 1894, an exhaustive series of cement tests and experiments of professional interest, which were carried on under the direction of E. S. Wheeler, assistant engineer in charge of the construction of the new lock for the St. Mary's Falls canal. About 50 pages of the report are devoted to a description of these tests and experiments.

A board, consisting of Comdr. Royal Bradford and Naval Constructors Bowles and Hanscomb, appointed to report upon the advisability of reducing woodwork on board ships, have submitted a preliminary report to Secretary Herbert. The report is not radical in character. It recommends, among other things, the replacing of wooden bulkheads with iron, and suggests a number of other instances in which this metal may be employed. It is the intention of the board to continue its investigation and conduct experiments with a view to obtaining some non-combustible material, not metal which may be used as a substitute for wood.

Naval Constructor Capps has submitted a report to Secretary Herbert showing that the shell of a submarine boat, constructed on the plans of the Holland torpedo boat company of New York, is amply sufficient to resist the explosive effect of torpedoes discharged at a short range. Experiments were conducted with the old lay torpedo shell, which was used in the Newport experiments, about a year ago. The shell of this vessel is scarcely thicker than ordinary tinplate, yet it bore the force of explosion very well until the range was brought within 80 feet, when it was severely battered. The Holland torpedo boat—which must be at least half an inch thick to withstand water pressure at considerable depths—will be strong enough to resist explosions at short range. Secretary Herbert is expected to award a contract for the construction of a submarine boat of the Holland type at an early day.

The engines which the Johnson Steel Company of Lorain is having built in England are probably as large as any that have ever been made in connection with a rolling plant. There are two large pairs of the horizontal high-pressure non-condensing type. The larger engine has cylinders 55 inches bore by 5 feet stroke, with crankshaft bearings 22½ inches in diameter, and the total weight of this engine will be about 300 tons. The smaller engine has cylinders 48 inches bore by 4 feet 2 inches stroke, with bearings 19½ inches in diameter, and the total weight will be about 200 tons. The pressure at which both will work is about 150 pounds per square inch.

If Admiral Meade could have his own way he would do many things out of the ordinary routine of the service, but all with a view to improving it and infusing into it new energy. He is a terror to those whose disposition it is to say "a little more sleep, a little more slumber, a little more of the folding of the hands to sleep." A man who can go to sleep when Admiral Meade is around must be a victim of the opium habit. He is an able officer if he does not always agree with the department.—Army and Navy Journal.

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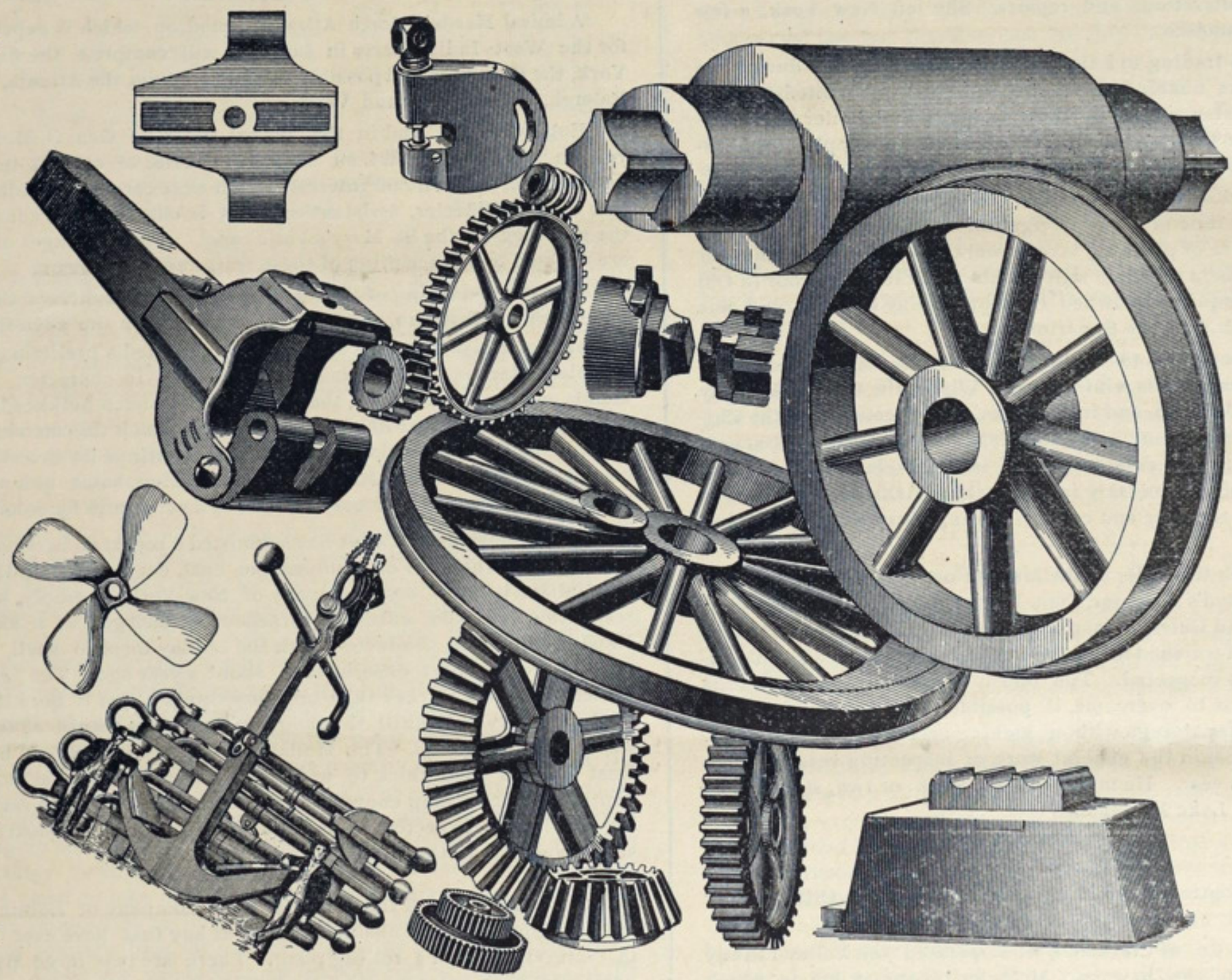

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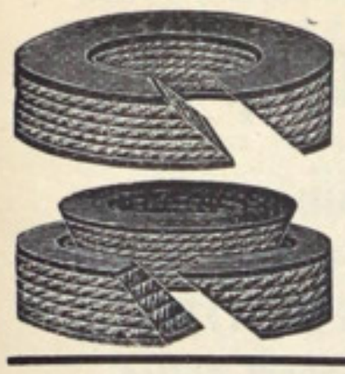

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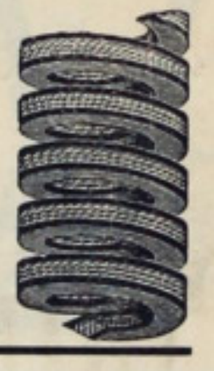

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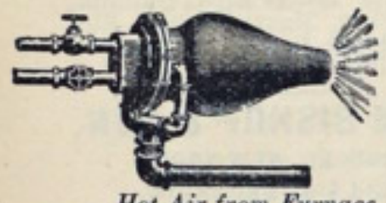

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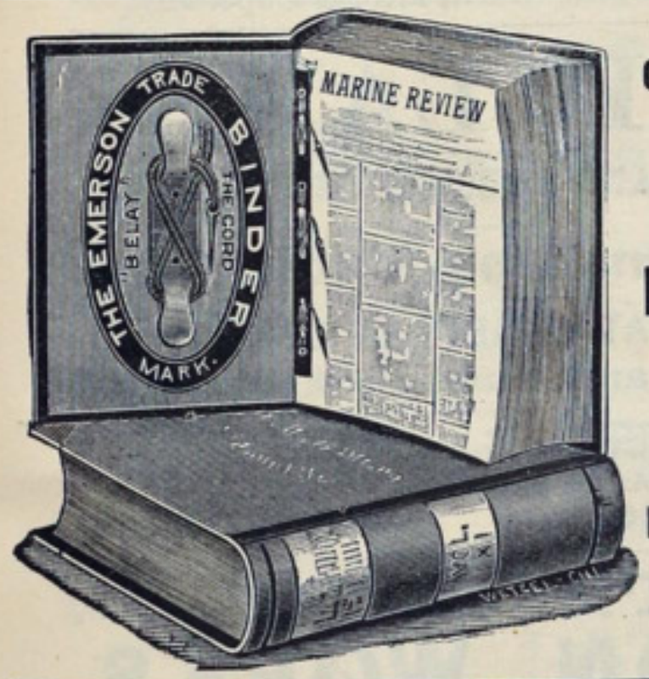

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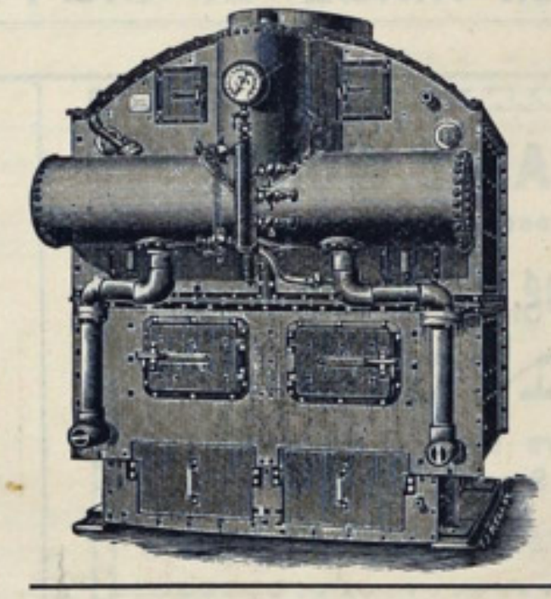

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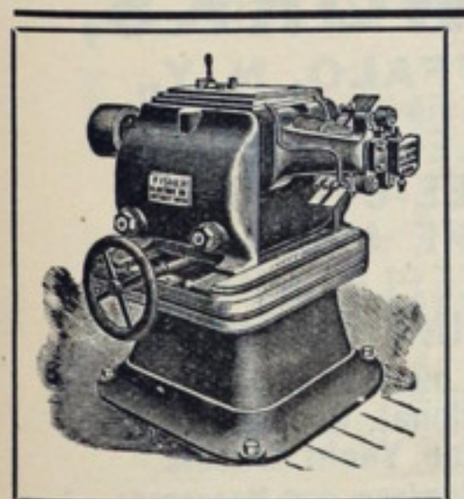

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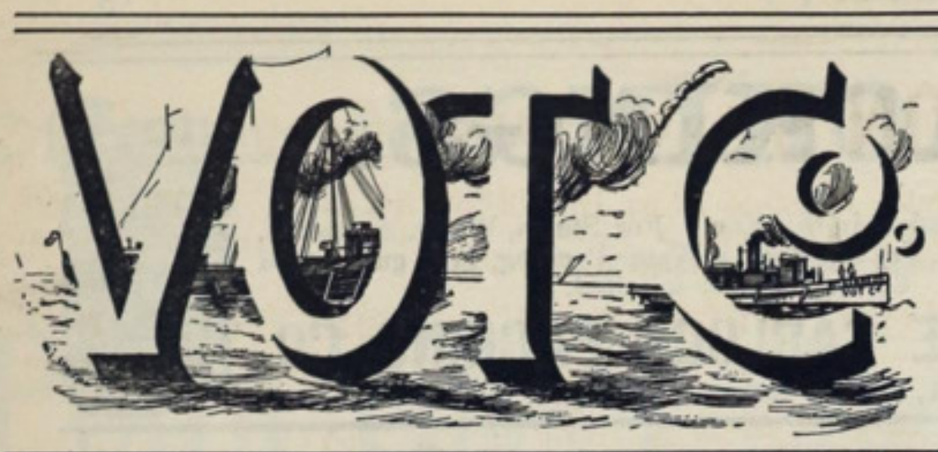

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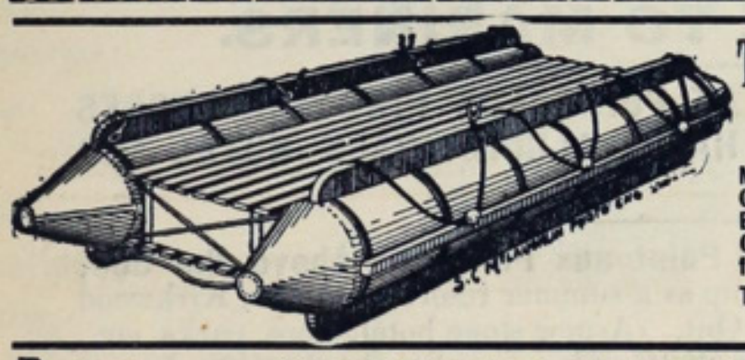

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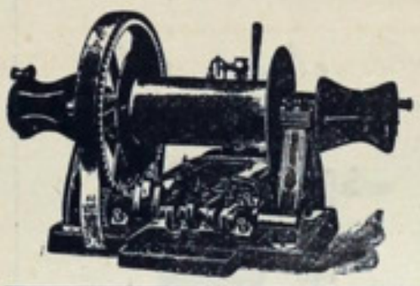

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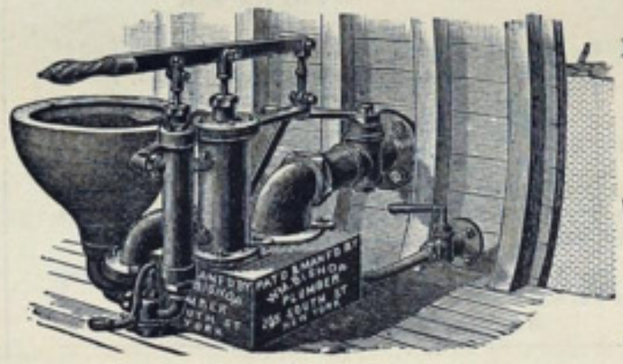

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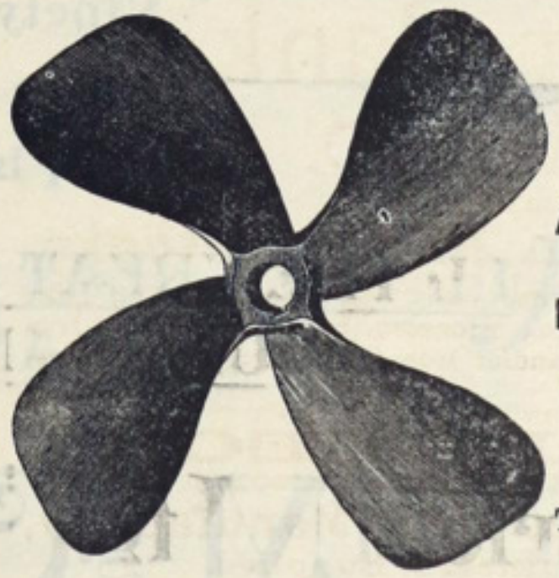

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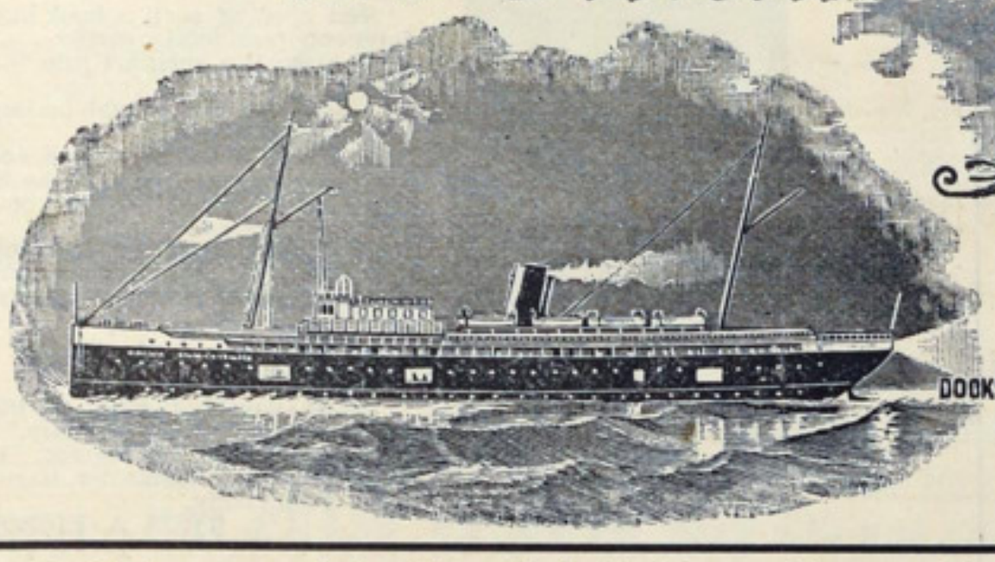

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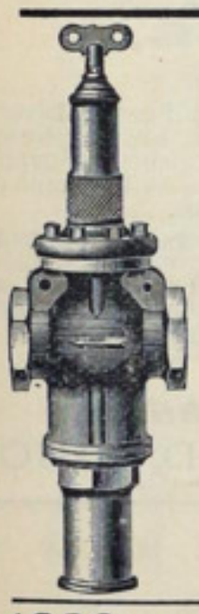

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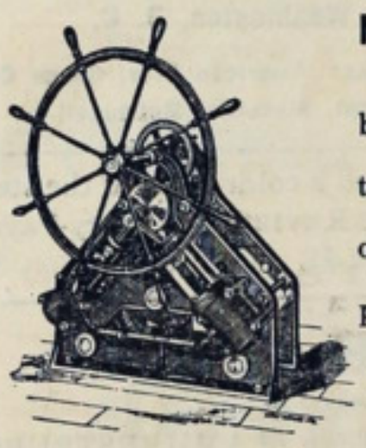

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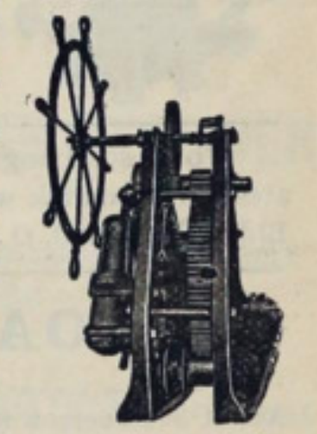

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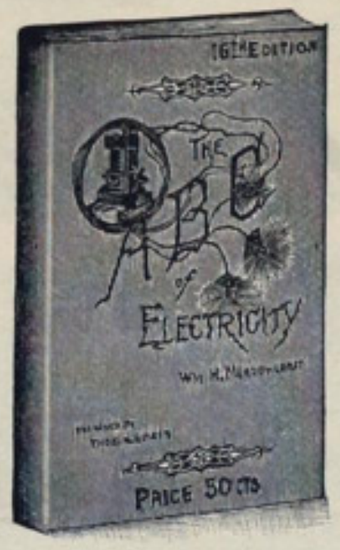

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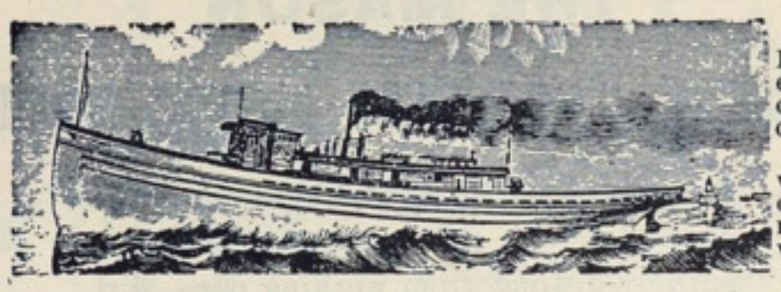

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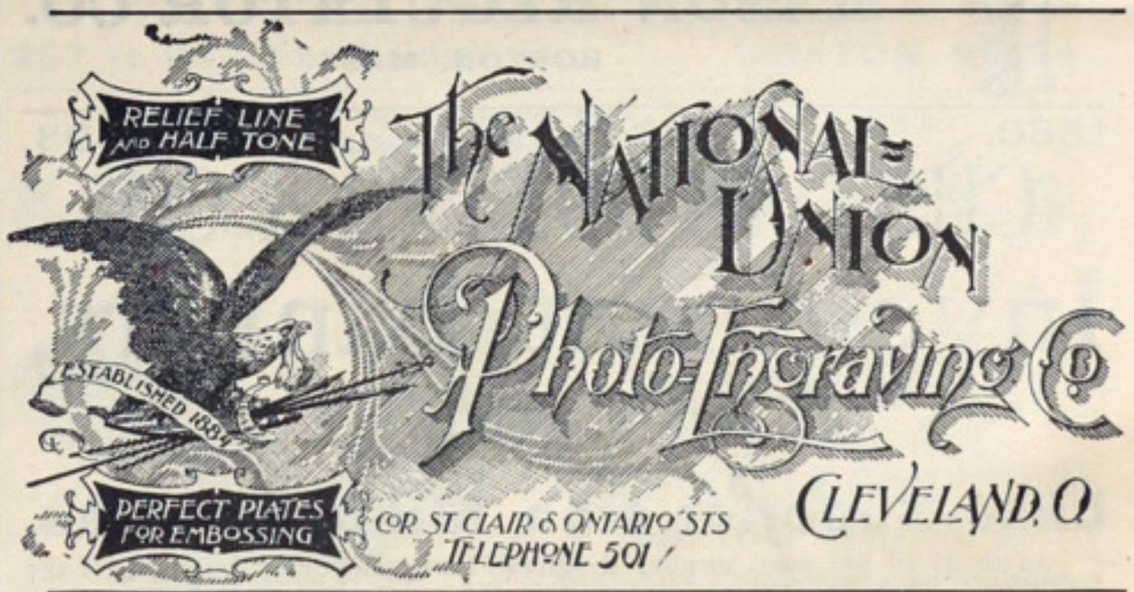

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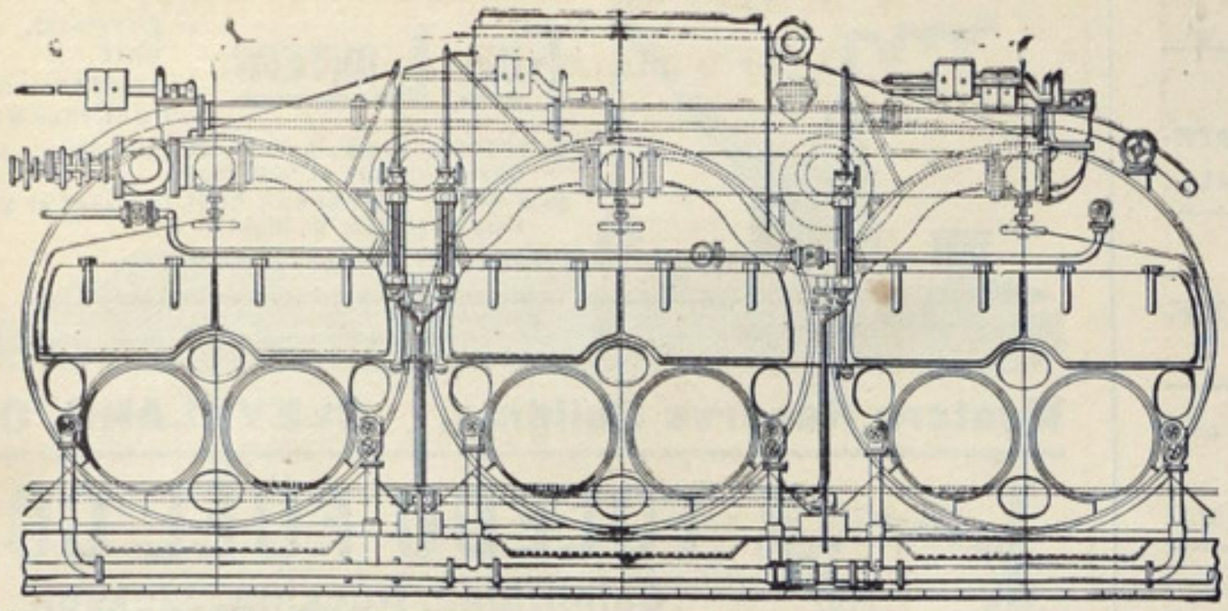

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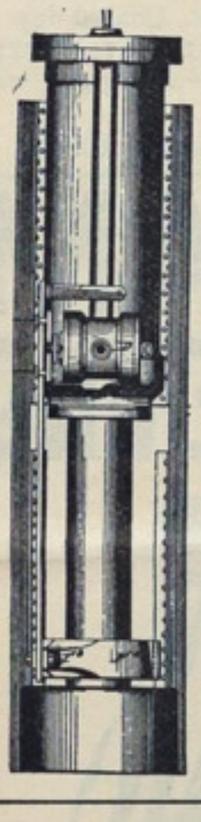

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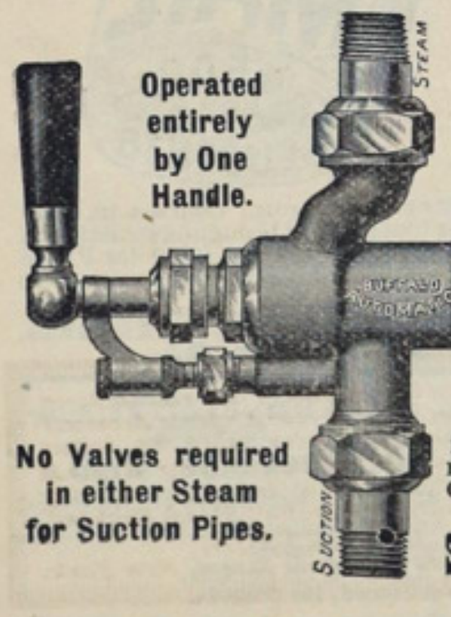

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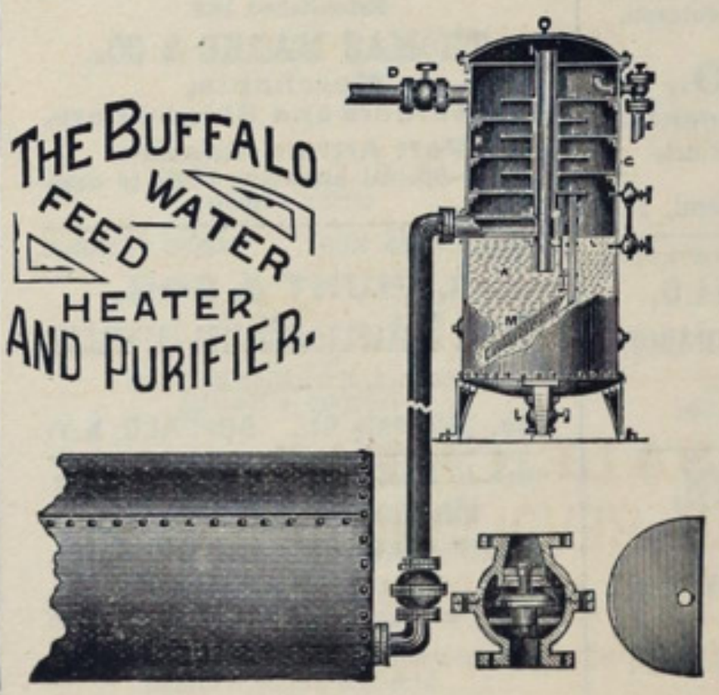

REFERENCES.

A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boiler.
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
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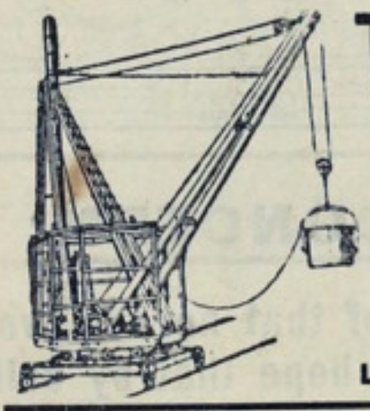
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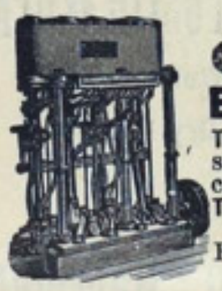
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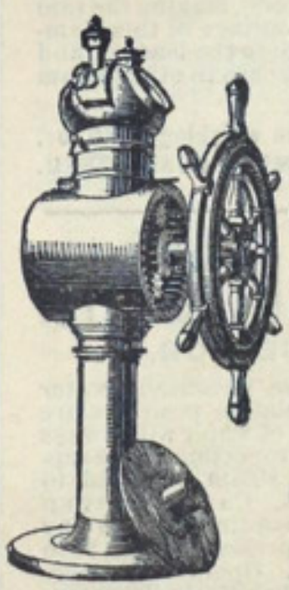
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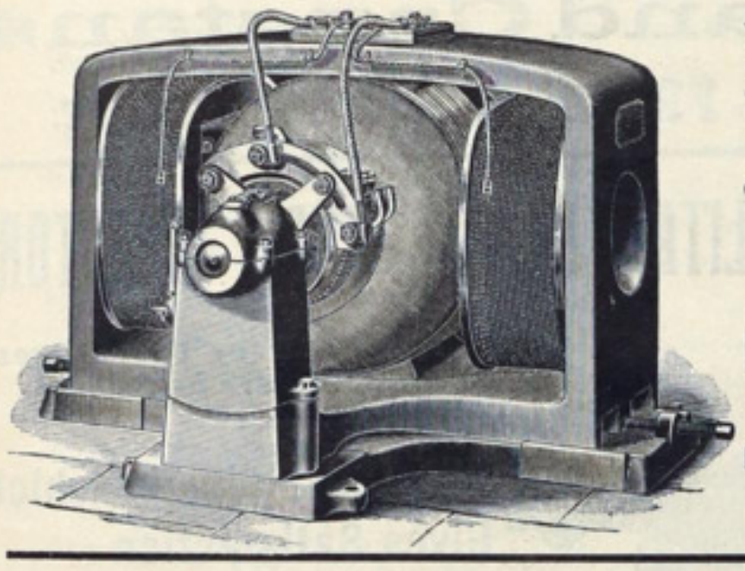

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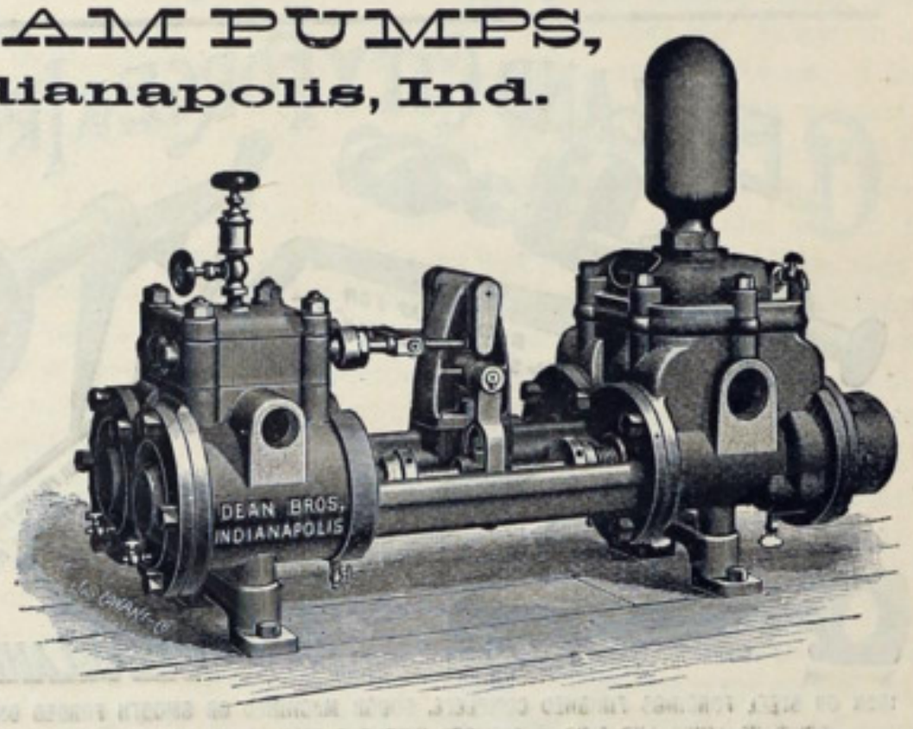

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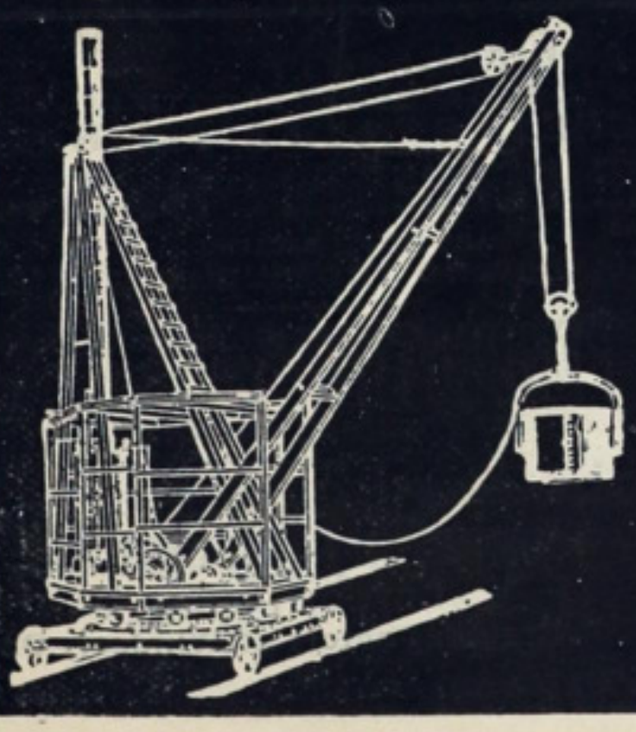

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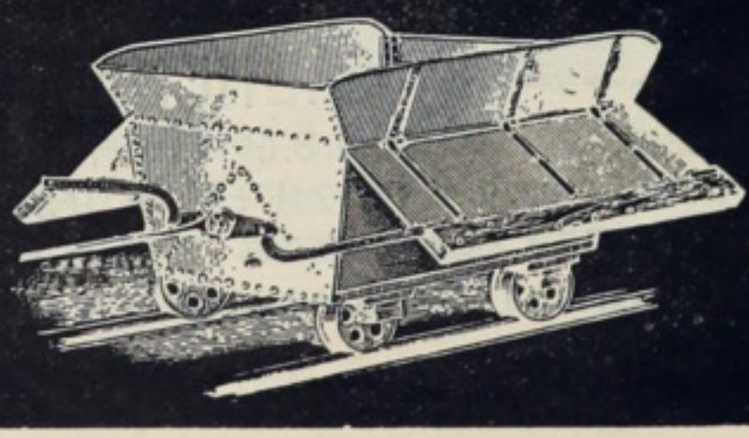

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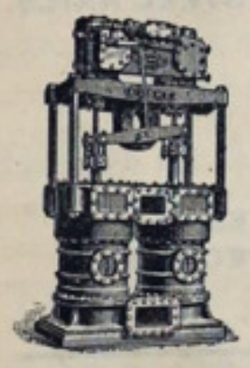

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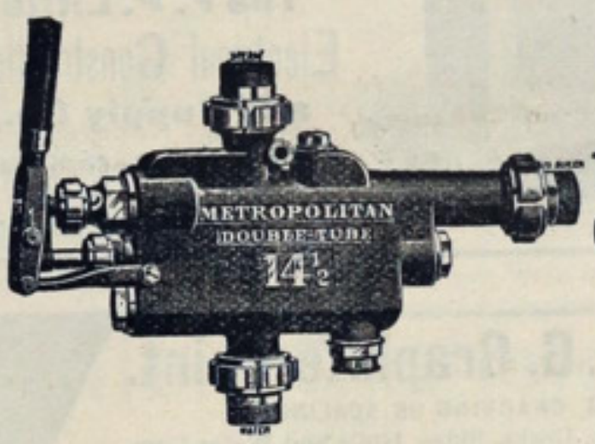

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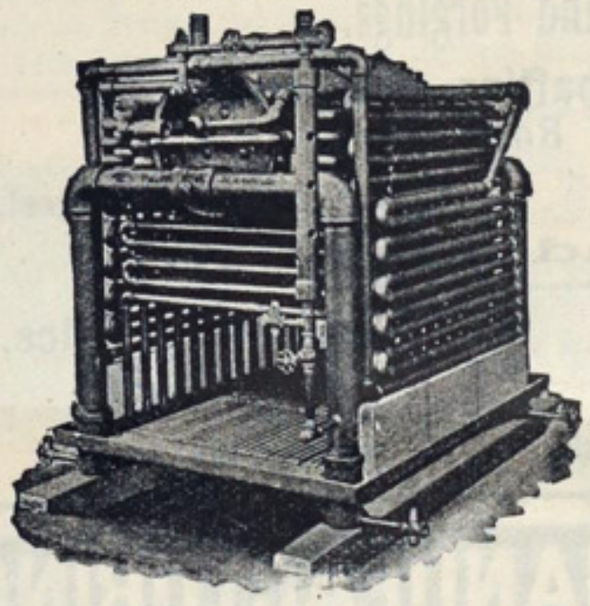

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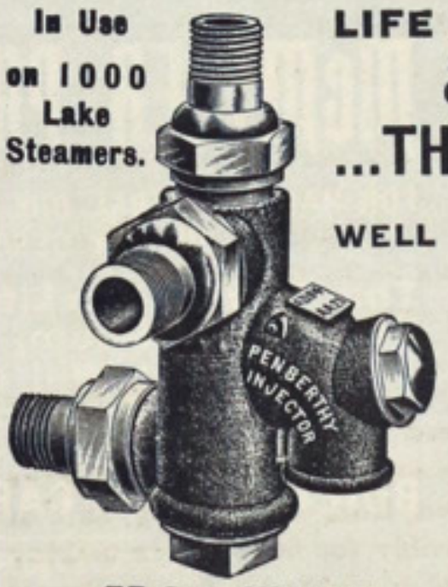

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